

Electricity Billing By Prepaid System Using Gsm Technology

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ABSTRACT:

We are introducing prepaid billing system in order to avoid steeling of electricity as well as to save more time of consumers by keeping them away from queues. Initially we are introducing the recharge coupons which will help to recharge the electricity by prepaid method. So that the consumer feels like more comfortable in using the electricity compared to present system. The amount will be reduced as per the usage of consumers. No need to bother about the month end at all. If the balance gets reduced he will be getting a message from electricity board that conveys his balance is getting low. So that an alert will always be there to remind them. And the other feature of the system is the consumer is allowed to switch off the main system while he is going out of his home. So that he can save the electricity as well as his amount too. A consumer number will be given to all consumers in different pattern which should be highly confidential. The system will be having the facility to show the balance and the energy consumption. The consumer will lose his connection if the consumer will not recharge at the proper intervals.

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INTRODUCTION:

In India the present system of electricity billing is done manually. So there is a chance of occurrence of errors. We have to wait in a queue for a long time for paying the bill in the electricity board. It is time consuming and labor consuming process. If we are not able to pay the bill on time, we may be forced to pay the fine along with the bill. So it is not a consumer friendly. These problems can be fixed by using a prepaid electricity billing system. So here we are introducing a prepaid electricity billing using GSM technology. In this, the consumers can use even their cell phone to recharge the system. And also we are having prepaid recharge coupons to recharge their account.

IMPLEMENTATION:

The main features of our system are recharging EB account using cell phone and internet, recharging using coupons, provision of an LCD to display the real time account balance and power consumption, the user can shutdown the main power supply by sending an SMS to the system and sending an alert message on low account balance to the consumer.

The main components of the system are potential transformer, current transformer, signal conditioner GSM module, PIC16f887, LCD display and relay. Potential transformer is used for controlling the high value of the voltage. The processor cannot handle high voltage. So we are

using potential transformer to make voltage low for the smooth working of the whole system. The current in circuit is somewhat high.

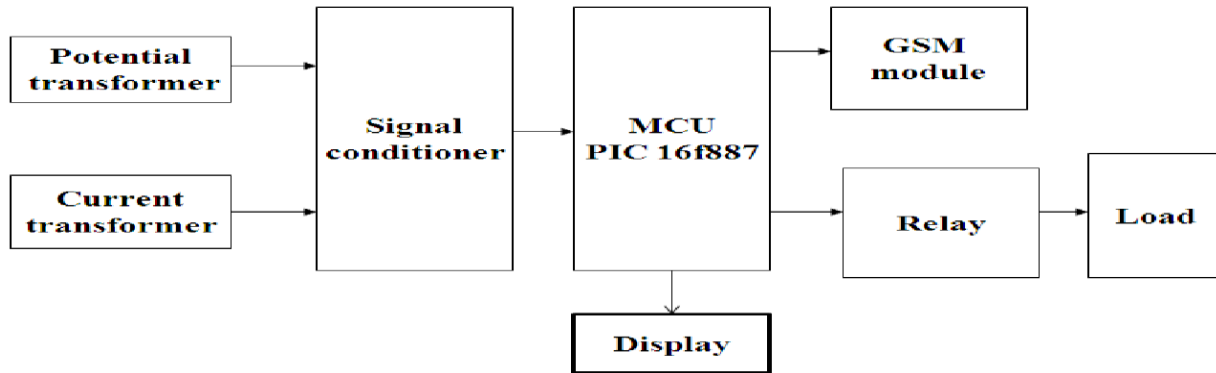
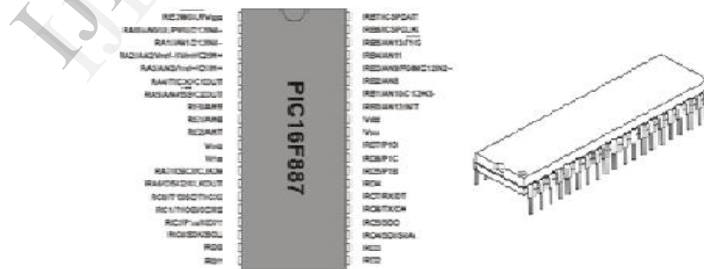


Fig. 1: Block diagram

These current cannot be handled by the microcontroller. So the current transformer is having used to reduce the current proportional to the current supplied by the electricity board. The main functions of the signal conditioner are amplification, filtering and isolation. Signal conditioner also pre process the signal so that the computing time of the microcontroller is being reduced. The system has to indicate the user about the consumption of the power and account balance. For these we are using the LCD display. In the display the real time account balance and the power consumed will be displayed.



GSM module[1]



MCU PIC16f887microcontroller[2]

Fig. 2: GSM module, MCU PIC Pin diagram

GSM (Global System for Mobile Communications), is a standard set developed by the European Telecommunications Standards Institute (ETSI) to describe protocols for second generation (2G) digital cellular networks used by mobile phones[1]. In this system GSM helps in sending and receiving the messages which deals with the information about users account balance and energy consumption. The PIC16F887 is one of the latest products of Microchip. For its low cost, wide range of application, high quality and easy availability, it is an ideal solution in applications such as: the control of different processes in industry, machine control devices, measurement of different values etc [2]. We have to trip the supply on insufficient account balance. For this purpose a relay is used. The consumer can trip the power by sending an SMS ‘OFF’. This will reduce the wastage of electricity.



Fig. 3: Prepaid billing system setup

Consumer can recharge their account by using the prepaid coupons provided by the electricity board. User has to send the code number from his cell phone to the system, the certain amount will be credited to the account of the user and they can use the electricity for that particular amount. The microcontroller will evaluate the power consumed by the user. If the account balance becomes lesser than the half of the amount of credited balance, then the system will send an alertness message to the user's mobile number. If the account balance becomes insufficient, by using the relay, the power supply to the whole house will be terminated. In Indian electricity billing system, the industrial users have to pay five times more than an ordinary consumer. By considering this, we made our system applicable for both of these consumers. We provide a switch for this purpose. So our system can work for both. If the user is going out of the house for a long time, they can shut down the power by an SMS to the system. The system received by the GSM will be processed by microcontroller and cut down the connection using the relay.

ADVANTAGES:

This system provides several benefits to the consumers. This technology can be operated easily by every consumer without any help from the EB employees. In this busy world people are more concern about their valuable and precious time. Our system helps them to save their precious time by avoiding them from queues in front of EB office. While the consumer leaves their apartment, they can terminate the main power supply in order to control the wastage of energy. As the consumer is having a clear idea about their account balance, the stealing of electricity can be avoided. It's quite natural in human to create errors while taking readings. This may lead to heavy lose for the consumers while paying the electricity bill. Hence such errors can be avoided easily by using this system.

CONCLUSION:

Everyone is more concern about their time in this busy world; few of them send a proxy or neighbors to pay their electricity bill. These difficulties can be easily avoided by using prepaid electricity billing system. Every consumer can recharge their EB account through their cell phones. Consumers can also control the wastage of energy by this system. Most importantly the manual error made by the employees while taking readings can be vanished by this system. The secret consumer ID given by the EB makes the users account more secure.

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